

NON-PUBLIC?: N
ACCESSION #: 8811090333
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Catawba Nuclear Station Unit 2 PAGE: 1 of 5

DOCKET NUMBER: 05000414

TITLE: Manual Reactor Trip Caused By a Loss of Main Generator Stator Coolant
Flow Due to a Personnel Error
EVENT DATE: 09/29/88 LER #: 88-028-00 REPORT DATE: 10/28/88

OPERATING MODE: 1 POWER LEVEL: 095

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION

LICENSEE CONTACT FOR THIS LER:
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Associate Engineer - Licensing

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE TO NPRDS:

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

On September 29, 1988, at 1252:55 hours, a Unit 2 reactor trip from 35% power was manually initiated upon loss of Main Feedwater (CF) to the Steam Generators (S/G) following a turbine runback on loss of Stator Cooling Water Flow (KG). Main Generator KG pump 2A was inadvertently tripped at approximately 1248 hours by Construction and Maintenance personnel. Following the turbine runback to 23% turbine load, a Hi-Hi level signal in S/G 2A resulted in a turbine trip and CF isolation. At this time, operations personnel manually tripped the reactor and took appropriate action to stabilize the unit. Unit 2 was in Mode 1, Power Operation, at 95% power prior to the loss of KG flow.

This incident has been attributed to a personnel error due to the inadvertent trip of KG pump 2A. Sporadic Condenser valve performance resulted in swing inventory in the S/G's and contributed to this event. The event was discussed with appropriate personnel. Condenser steam dump valve deficiencies will be corrected.

The health and safety of the public were unaffected by this event.

END OF ABSTRACT

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BACKGROUND:

The Generator EIIS:GEN! Stator Cooling Water EIIS:TJ! (KG) System is a closed loop cooling system that circulates high purity water through the stator coil hollow conductors for removal of heat due to stator coil EIIS:CL! heat losses, along with providing other miscellaneous cooling functions.

Either of two AC motor EIIS:MO! driven centrifugal pumps EIIS:P! will produce the required flow of cooling water. Pressure actuated switches cause automatic start-up of the reserve pump in the event of pressure decreases.

In the event stator cooling water flow is lost, the Turbine EIIS:TRB! runback circuitry will automatically reduce the generator output to the rated capability without stator cooling water circulation (approximately 23% Turbine load).

DESCRIPTION OF INCIDENT:

On September 29, 1988, at 1248:47 hours, Construction and Maintenance Department (CMD) personnel inadvertently bumped the (KG) Pump switch to the OFF position while removing masking tape after the panel was painted. As a result, KG Pump 2A tripped, and due to the switch position, the reserve KG Pump 2B was prevented from automatically starting. The loss of the Stator cooling water flow automatically initiated a Turbine runback which reduced Reactor EIIS:RCT! power from 95% to 35% in approximately 3 minutes. As the Turbine runback began, the Condenser Steam Dump Valves EIIS:V! (SB) and Atmospheric Steam Dump Valves (SV) modulated open as designed. The Control Room Operator (CRO) was alerted by the "H2/KG Panel Trouble" annunciator, and dispatched an Operator to investigate.

The Turbine continued the runback, apparently failing to halt at the "No Liquid Capability" setpoint. The Operator reached the panel and returned KG Pump 2A and 2B to service by resetting the KG Pump switch. The Turbine runback was terminated at this time.

An increasing Reactor Coolant System EIIS:AB! average temperature (Tave) due to erratic operation of the SB valves following the Turbine runback resulted in a Steam Generator (S/G) level swell. In responding to the increasing Tave, condenser Steam Dump Valve, SB6, fully opened, resulting in a further S/G level transient. At 1252:49:529 hours, the S/G A Hi-Hi Level (P-14) automatically initiated a Turbine trip and Feedwater Isolation, and trip of both Main

Feedwater EHS:SJ! (CF) Pumps. At 1252:50 hours, Auxiliary Feedwater EHS:BA! (CA) autostart occurred followed by Blowdown and Sampling isolation. The CRO initiated a manual trip from 35% reactor power at 1252:55:413 hours, as required per procedure when CF is lost and Reactor Power is greater than 10%. The CRO reestablished normal levels in the S/Gs.

On September 30, 1988 at 0405 hours, the CROs secured CA Pump 2B, then returned the CF Pumps to service, and at 0612 hours, secured CA Pump 2A. The Feedwater Isolation was reset and the feedwater, blowdown and sampling valves were realigned. The Unit entered Mode 1, Power Operation, at 2315 hours, on that day.

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CONCLUSION:

This incident has been attributed to a personnel error due to CMD personnel inadvertently bumping the Stator Coolant Pump Switch to OFF during the painting of the panel.

Additionally, the sporadic operation of the Condenser Steam Dump valves contributed to this event. These valves did not properly respond to T-ave/T-ref conditions following the Turbine runback, and the sudden opening of Condenser Steam Dump valve, SB6 resulted in a S/G level transient. The malfunction of the Steam Dump controls will be investigated.

SB Valve internals will be modified to reduce steam leakage past the piston seal rings. The valves will also be modified to provide a release for steam leakage past the seal rings. SB6 is manufactured by Control Components, model B2A6-X8-X8B.

CMD Supervisors have reviewed this incident with their personnel emphasizing the importance of maintaining communications with Operations concerning equipment sensitive to continued plant operation.

Instrumentation indicated a loss of NC Pump C Seal Leakoff flow following the Reactor trip. It was unclear whether this was an actual or indicated flow problem. Upon review of the alarm summary, the No. 1 seal leakoff temperatures and NC Pump lower radial bearing temperatures stayed below their alarm values.

A review of previous events revealed no Reactor trips due to personnel inadvertently moving a switch to the wrong position.

CORRECTIVE ACTION:

IMMEDIATE

The CRO dispatched an Operator to investigate the KG panel.

SUBSEQUENT

- (1) The Operator reset the KG Pump switch and returned the KG Pumps to service.
- (2) Operations personnel entered EP/2/A/5000/001A, Reactor Trip Response.
- (3) Operations personnel manually tripped the Reactor in response to Feedwater Isolation.

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- (4) Operations personnel isolated Condenser Steam Dump Bank 1 to maintain proper steam pressure.
- (5) Work Request 41481OPS has been submitted to investigate and repair Condenser Steam Dump valve control problems.

PLANNED

- (1) The apparent failure of the Generator "No Liquid Capability" setpoint to terminate the Turbine runback will be investigated.
- (2) Operational deficiencies of the Condenser Steam Dump valves will be corrected.
- (3) Discussions will be initiated to improve communications between Station Groups concerning CMD work activities and their potential impact on plant operations.
- (4) The indicated loss of NC Pump C Seal Leakoff flow during transient conditions will be evaluated.
- (5) Corrective actions for all inadequate response items identified in the Post-Trip Review will be developed.

SAFETY ANALYSIS :

The transient assessment of this incident showed a normal plant response due to the loss of the KG Pumps. Turbine runback was initiated automatically as expected. The sporadic operation of the Condenser Steam Dump valves caused a swell in the S/G levels and initiated an automatic trip (P-14) of the Main Turbine and also initiated Feedwater Isolation.

With the Reactor power greater than the 10% and a Feedwater Isolation, the CRO manually tripped the Reactor as required per procedure.

Upon the manual Reactor Trip signal, all control rods dropped in the core and Reactor Power decreased to zero. Pressurizer EIIS:PRZ! pressure did not decrease below 2036 psig nor increased above 2242 psig following the trip, as expected.

Pressurizer EIIS:PRZ! level generally remained between 28% and 33% with an

xception of a spike to 44% following the trip. The Reactor Coolant System temperatures dropped from 573 degree F at trip initiation to 560 degree F post trip. The highest S/G pressure at trip initiation was 1103.7 psig and stabilized to 1014.65 psig (lowest). The S/G level at trip initiation was 78% wide range and increased following the trip to 85% wide range. Due to wide range exceeding 78%, this transient is classified as a B response.

The S/G Hi-Hi Level Trip (P-14) and subsequent Turbine trip is an accident scenario addressed in Section 15.2.3 of the Final Safety Analysis Report. The

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Main Feedwater Isolation signal and the subsequent S/G Low Low level Reactor trip is also a scenario addressed in Section 15.2.7 of the Final Safety Analysis Report. The S/G transient and the resultant plant response is bounded by these analyses. This event is reportable pursuant to 10CFR 50.73 (a) (2)(iv). The health and safety of the public were unaffected by the event.

ATTACHMENT # 1 TO ANO # 8811090333 PAGE 1 OF 2

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DUKE POWER

October 28, 1988

Document Control Desk
U. S. Nuclear Regulatory Commission

Washington, D. C. 20555

Subject: Catawba Nuclear Station, Unit 2

Docket No. 50-414

LER 414/88-28

Gentlemen:

Pursuant to 10 CFR 50.73 Section (a) (1) and (d), attached is Licensee Event Report 414/88-28 concerning a reactor trip caused by a loss of main generator stator coolant flow due to a personnel error.

This event was considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

Hal B. Tucker

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Attachment

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